

EAO – Your Expert Partner for  
**Human Machine Interfaces**



**Passenger Transportation Applications**

**Components and HMI Systems**

[www.eao.com/catalogues](http://www.eao.com/catalogues)

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Foto: SBB

# EAO – Partner of the transportation industry

## Customised public passenger transport operating systems

The first illuminated pushbutton of EAO was introduced to the market in 1958. The product became a cornerstone of the company's future and set the standard for an entire industry. Since then, EAO has expanded and consolidated its position as one of the world's leading expert partners for Human Machine Interfaces (HMI). Thanks to its extensive expertise and its exemplary innovative capabilities, EAO offers a comprehensive range of highly reliable actuators and indicators and components. The company also develops and creates complete customer-specific operating systems for the transportation industry.

Public transport companies around the world benefit from the superior design and from the reliability, quality and durability of EAO products and systems. These products are used in all passenger transport applications – be it in trains, buses, trams and underground trains. EAO customers appreciate the wide choice of standard products and consistent global availability.

All of these factors have led EAO to set the standard in the transportation sector. Unique interfaces and control systems, as well as command and signalling devices, are individually designed and created for an extensive range of specific applications. EAO aligns the equipment to the task at hand, thus enabling users and technologies to work in complete harmony. This results in interfaces that are of superior quality, more functional and easier to use.



**BOMBARDIER**





## Leading industrial design

The foundation for successful HMI solutions lies in a profound understanding of design, ergonomics and production standards. EAO customers draw on the vast experience in this sector to enhance their own core competences in the development and integration of HMI systems. EAO acts as both a supplier for their customers and, in many cases, as a support of their in-house development team.

## Key applications

EAO produces high-quality components and systems for the public and private transport sectors. These enable the communication between driver and passengers and are used in the following applications:

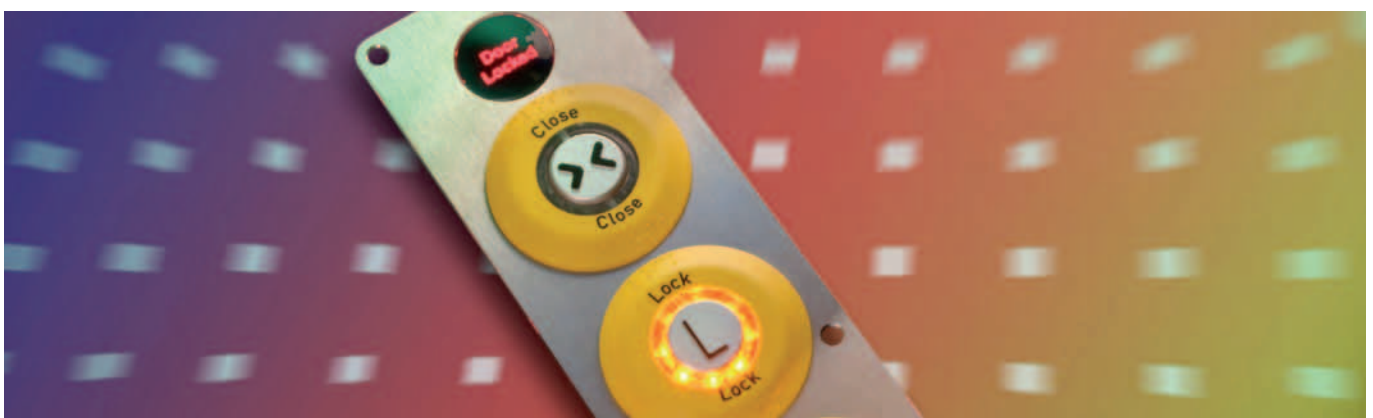
- Driver panels
- Door opening systems
- Operation monitoring systems
- Toilets
- Emergency call equipment
- Passenger information systems

The audible, tactile and visible displays, combined with the bright illumination and the freely programmable acoustic warning signals, are unrivalled. They are extremely reliable, withstand vandalism and meet the relevant recommendations and guidelines.

## Well-known users

Leading OEMs and operators of public transport systems around the world trust in EAO's experience.

- Stadler Rail AG
- IFE Automatic Door Systems
- Bombardier Inc.
- SBB
- SNCF
- FS / Trenitalia
- Gebr. Bode GmbH & Co. KG
- and many more





# EAO – Improving the public transport experience

Ergonomic design for easy operation



## Passenger entry systems

EAO door openers have come to be used all over the world. Installed in their millions, they prove themselves on a daily basis under extreme climate conditions, from the Polar Circle to the deserts of Saudi Arabia. With their sturdy design, they withstand “wash downs” very well.

Door openers from EAO also exceed the requirements for longevity. Once installed, the operator must be able to trust that the devices will continue to function properly for 10 to 15 years. The ‘Made in Switzerland’ brand excels in this respect. Of course, all EAO door openers meet the relevant standards and guidelines.

EAO door openers with or without illuminated symbols are used in the following: Trains, Trams, Buses, Underground trains, Ships, Lifts, Escalators.



## Multi-Tone sound modules

EAO set a new benchmark with the introduction of the multi-tone sound module (MTSM) to the market. The MTSM enables operators of passenger transport systems to use a precisely defined sound sequence depending on their requirements.

Here are some application examples:

- Warning signals ‘Door opening/ closing’
- Warning signal for cockpits
- Signal to find doors
- Alarm signal for toilets
- Alarm signal in lift systems

The MTSM complies with conventional international standards, e.g., TSI/PRM.



## Trains

EAO is not only one of the leading providers of HMI solutions for train cockpits worldwide, but passenger entry systems and specialised products like key-lock switches are also part of the portfolio. Customers and users alike benefit from the renowned reliability and appreciate the following properties in particular:

- Excellent ergonomic design
- Highest degree of usability
- Unique tactility
- Unrivalled haptic feedback

Both train staff and passengers appreciate EAO products – and have done so for more than 40 years.

## Buses

Getting passengers on and off the bus safely and quickly is the top priority in bus applications. EAO passenger entry systems significantly contribute to a fast passenger turnover and to increased passenger security.

Thanks to the excellent illumination and ergonomics, EAO devices and operating systems are particularly prized by drivers. These features, including energy-efficient LEDs, ensure high visibility and secure operations day and night.

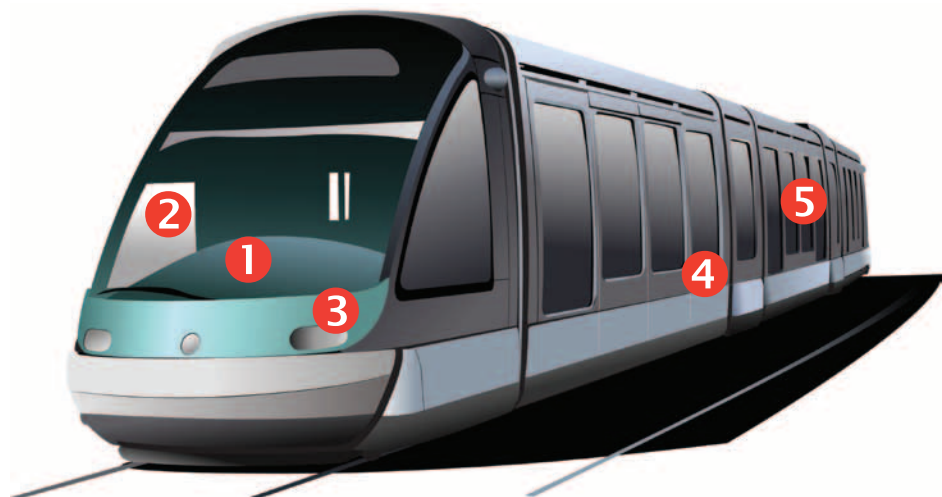
Staff in the garage appreciate the fact that the panels can be exchanged quickly and easily in order to adapt to future requirements thanks to printed circuitry and serial bus connectors.

## Trams and underground trains

The routes taken by trams and underground trains often change between the street level and underground. This places particular requirements on the driver panel – perfect readability of the device and HMI systems are particularly important for the driver. With their dimmable illumination, the EAO products that have been awarded the 'IF' Industry Design Award ensure that the brightness of the lights can be changed according to the environment, which counters dazzling and prevents the eyes from getting tired.

From the passenger's point of view, the large user-friendly door opening keys, animated illuminated pushbutton sequences, and the individually programmable multi-tone sound modules are greatly appreciated – just another contribution from EAO to safe passenger transport.

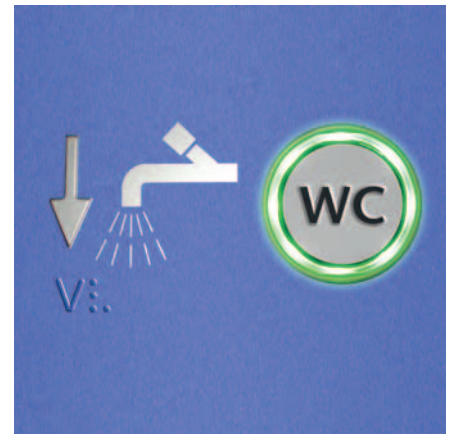
- 1 Driver's desks
- 2 Driver's cab sidewall panels
- 3 Auxiliary desk controls
- 4 Passenger access
- 5 Toilet modules





# EAO sets the standard – worldwide

TSI/PRM compliant for easier operation by less able-bodied people



## Peripherals

EAO operating systems are also highly suited for the peripheral applications in trains. Engine drivers and accompanying train staff can send all kinds of commands and rely on the definitive implementation and the feedback of the devices. Examples include the locking or unlocking of doors, turning lights on and off or operating communication systems. As one of the leading providers of actuators and indicators, EAO knows what matters when it comes to public transport and is happy to share this knowledge with customers and business partners.

## Toilets

Modern EAO panels for train toilets are in heavy-duty use in countless trains all over the world. In the case of these systems, usability and reliability are the highest priority. New trains must fulfil the technical specification TSI-PRM. This defines the specific requirements for people with restricted mobility in railway travel, including universal toilets. “A visual and tactile (or even audible) display must be provided in order to give information on when a door is locked.” The extensive EAO range includes the following:

- Complete systems (toilet panels, including braille lettering)
- Switches with ring illumination
- Lever switches ‘rugged door switches’
- Warning signals with multi-tone sound modules, MTSM



## Lever switch

Special robust and elegant lever switches, also known as ‘rugged systems’, were developed primarily for applications in the hygiene sector and have mechanical left/right or right/left switch sequences. Simplest operation (with an actuating force of less than 15 newtons), combined with superior vandal resistance makes this switch from EAO unique. The devices, which are used in thousands of installations, are employed primarily in the following applications:

- Toilets in trains
- Toilets in coaches

## Key insert switch

Special key insert switches from EAO enable staff to open or close all doors simultaneously from a single location. Thanks to this security feature, all doors of the train can be opened or closed in one rotation if required or in the case of an emergency.

## Standards

EAO products and systems meet the standards relevant for the transport industry. Furthermore, EAO cooperates closely with the standard committees. This ensures that EAO is involved from the outset in the definition of new provisions and can make a significant contribution to the development of practical solutions. The company also places great emphasis on maintaining relations with disabled persons organisations in the countries in which these actuators and indicators and HMI systems are used. Of course, all of these products meet important standards and guidelines, including the following: ADA, IRIS, TSI/PRM, UIC, CE, RoHS, ENEC, CB, UL/UR, CSA, VDE, SEV, CCC, GHOST and German Lloyds.



## From initial concept to production

With EAO as an expert partner, EAO customers benefit from the company's many years' experience and its extensive knowledge in design and production:

- HMI system design and layout that is functional and intuitive.
- Ability to harmonise overall system ergonomics, functionality and appearance.
- Compliance with all relevant safety and operational industry standards.
- Use of cost-effective quality components.

As a developer and manufacturer of high-quality HMI components and systems, EAO's expertise in prototyping, tooling, plastics moulding, plating, electrical design and automation is unsurpassed. Highly qualified and motivated employees ensure that clients and business partners are satisfied.

## Quality assurance and testing

EAO has a total quality management (TQM) system that covers all business aspects. The system is certified according to ISO 9001 and ISO 14001.

EAO products and processes undergo rigorous testing on a regular basis to assure reliability, repeatability and long product lifecycles. The required testing capabilities include:

- Environmental test chambers.
- Ingress protection (IP) testing.
- In-circuit testing (ICT)
- Optical and X-ray analysis
- Finite element analysis

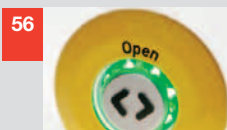
The strict implementation of TQM and the compliance of international standards ensure that EAO will remain to be a globally leading partner for the planning, design and manufacturing of HMI systems for the transport sector even in the future.



### **EUDDplus – European Drivers Desk Advanced Concept Implementation**

EUDDplus project aims at the development of an innovative vehicle concept for both – passengers and freight – characterised by interoperability and inter-connectivity, for cross-border operation on the Transeuropean Network, supported by advanced mechatronics and on-board electronics.

*EAO (Lumitas) is a partner within this EU project, ranging from conception right through to production*



# Products

Series	04	14	22	44	51	56	61	71	84
<b>Range</b>									
Pushbutton	■	■	■	■	■	■	■	■	■
Indicator	■	■	■	■	■	■	■	■	■
Selector Switch	■	■		■	■		■	■	
Key Switch	■	■	■	■	■		■	■	
E-Stop	■			■			■		■
Buzzer		■				■			
Level switch	■								
Mushroom pushbutton	■	■	■	■			■		
<b>Mounting</b>									
Flush	■	■	■	■	■	■	■	■	■
Raised	■	■		■	■	■	■		
<b>Mounting hole</b>									
∅ 16 mm					■		■		
∅ 22.5 mm	■	■		■	■		■	■	■
∅ 30.5 mm	■	■		■					
∅ 43 mm						■			
Square/rectangular	■		■		■		■	■	
<b>Switch rating max.</b>									
42 VAC/100mA									■
250 VAC/3A								■	
250 VAC/5A		■	■		■		■		
400 VAC/10A			■						
500 VAC/10A	■								
660 VAC/10A				■					
137 VDC/VAC/200mA						■			
<b>Terminals</b>									
Solder		■			■				
Solder/Plug-in		■			■		■		■
Plug-in	■		■						
Screw	■		■	■			■		
PCB		■			■			■	■
PCB-Terminal available		■			■		■		
Push-in terminal	■								
Cable						■			■
<b>Front Protection degree</b>									
IP 40		■				■			
IP 65	■		■	■	■	■	■	■	■
IP 67	■	■				■			■
IP 68 (with protective cap)	■	■		■	■		■	■	■
IP 69K						■			
<b>Suitable Applications</b>									
Indoor Applications	■	■	■	■	■	■	■	■	■
Outdoor Applications	■	■	■	■	■	■	■	■	■

For more information on these products and many more consult the EAO catalogue or contact your local sales office (see overleaf).

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